FREEHOTWATER
SOLAR THERMAL SOLUTIONS™

Installer / Service Provider details

USER MANUAL
INSTALLATION
INSTRUCTION
WARRANTY REGISTER

Free Hot Water Solar Storage Tank (SST) with Single/Double coil heat exchanger

Customer / User
Congratulations for choosing a Free Hot Water Solar Storage Tank
We recommend you read page 1 to 5 of this manual.
It may save you time and trouble later.
Please register the product warranty as per page 20 of this manual

The other pages of the manual are intended for the installer.

For a further assistance or information contact our service desk
☎ 408-432-9900 **info@freehotwater.com**

IMPORTANT INFORMATION

Free Hot Water Soar Storage Tank should be installed in accordance with these installation instructions, Local plumbing regulations, municipal building codes and any other relevant statutory regulations.

Observation of these instructions and the associated component instructions is most important and failure to do so could void the benefits of warranty.

All work is to be carried out by a registered plumber, and to be in accordance with Local and National Occupational Safety Guidelines.

The information contained in this manual, and all other information or advice provided by Free Hot Water Limited in connection with the purchase, installation use and service of the Free Hot SST, is given in good faith. Free Hot Water will not be liable for any person for any inaccuracy or omission in the information arising through the fault of Free Hot Water directly or indirectly.

A pressure-limiting valve of 70 PSI (500kPa) max rating must be fitted. Failure to install a pressure limiting valve where required will void the warranty.

SAFETY

Scalding occurs at 120 F (50^{0}C). This appliance is capable of providing hot water above this temperature. All installers must install an anti scalding valve and advise customers of the potential hazard of scalding in accordance with the relevant National standards.

Young children should not play with the appliance.

A combination Temperature Pressure Relief valve with a maximum rating of 120 Psi (850kPa) must be fitted.
Water may drip from the discharge pipe of this valve.
This pipe must be left open to the atmosphere.
For more information, please refer to the Regular Care section on page 5 of this manual.

These safety devices must not be tempered with or removed from the appliance under any circumstances.

Warranty Exclusions:

Free Hot Water warranty will not cover the following situations:

1. Failure because of misuse, damage, neglect or abuse
2. Product is not installed, operated or serviced in accordance with this manual or the US building code
3. Damage caused by an act of God
4. Water quality outside the range of page 5 of this manual
5. Connection of any associated heater with a max kW Rating higher than the coil capacity as per page 4 of this manual
6. Use of water temperature or pressure, or coil temperature or pressure, outside the restrictions of page 4 of this manual
7. Water hammer or negative pressure occurring in water Plumbing

Notes:

- Free Hot Water Limited is not liable for any sequential damages such as walls, carpets, furniture etc.
- Replacement water heater or parts provided under this warranty does not carry a new warranty. The unexpired warranty remains effective.
- Free Hot Water Limited is only liable for the water heater and will not assume directly or indirectly any other obligations in connection with the product

REGULAR CARE LOGON

Installation Date: ____/____/____

6 months: TPR Valve check date: ____/____/____

12 months TPR Valve check date: ____/____/____

18 months TPR Valve check date: ____/____/____

2 years TPR Valve check date: ____/____/____

30 months TPR Valve check: ____/____/____

3 years service by: _____ date: ____/____/____

42 months TPR Valve check date: ____/____/____

4 years TPR Valve check date: ____/____/____

54 months TPR Valve check: ____/____/____

5 years service by: _____ date: ____/____/____

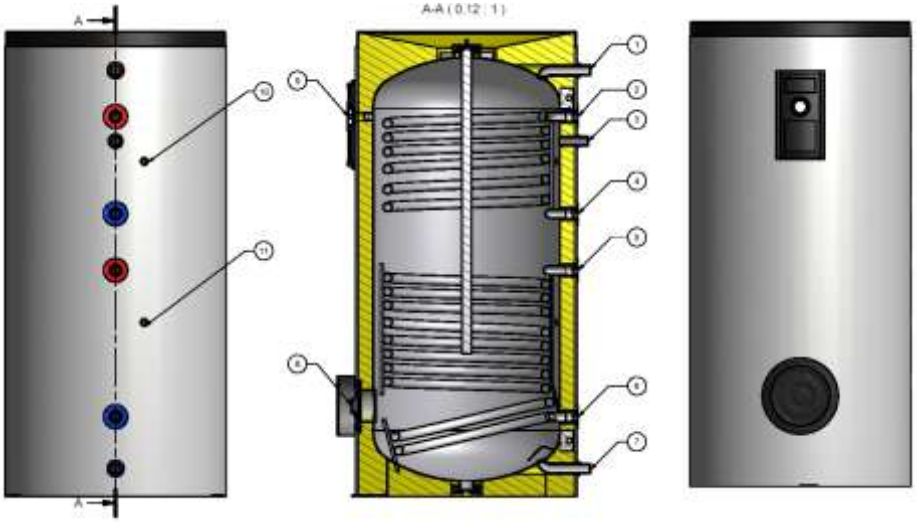
Notes:

ABOUT YOUR WATER HEATER

1. Free Hot Water SST is a high technology tank backed up by new manufacturing methods in order to offer quality of goods to consumers.
2. The main goal of producing the Free Hot Water SST Tanks is heating and storing potable hot water in a main pressure storage tank using solar energy. Potable hot water is stored in the main water storage tank separately from the heating liquids in the coils.
3. The heating fluid, which is heated in the heat source, is circulated between the heat source and tank's coil. The warmed fluid takes its heat from the heat source and transmits to the water heater.
4. Free Hot Water tank inner surface is enamelled. The meaning of enamelled coating is as covering sheet irons inside surface with glass.
5. Free Hot Water tanks are protected by a magnesium anode rod in order to prevent the damage of cathode corrosion. The magnesium anode rod ought to be replaced every 36 months by a certified plumber, and can be installed and uninstalled. The replacement steps of the magnesium anode rod must be followed according this manual.
6. Free Hot Water exterior surface is covered by 2.5 lbs/cm³ (40 kg/m³) and 2" (50 mm) polyurethane (except 800D and 1000D) in order to diminish the loss of the heat. The Free Hot Water 800D and 1000D insulation foam is removable. This convenience allows easy delivery and access through narrow doors for tank placement.
7. The type of water heater to choose (single or double coil) depends on the heater and if you are planning to extract heat. For example, if the tank will be heated with a solar system, Free Hot Water single coil water heater would be appropriate.
8. Free Hot Water SST has been produced to suit a wide range of applications and installation shapes.

In this manual we present the most common applications, however if you require advice on any other application, please contact our service desk on 408-432-9900 or info@Freehotwater.com

PRODUCT INFORMATION



Notes: 800D & 1000D foam insulation is removable and 2 pcs. DN100 inpection flange.
All Free Hot Water models have a soft blanket cover for extra insulation and 1pc. DN100 inspection flange. Only the Storage tank which have heating element has Plastic flange door.

WARRANTY REGISTRATION

Warranty registration is highly important, as it confirms installation date and installations type to ensure that you enjoy the full benefits of the product warranty.

Registration **Option 1**: go to www.FreeHotWater.com under warranty register
Registration **Option 2**: Call our service desk on 408-432-9900
Registration **Option 3**: Fax the below form to 408-872-4142
Registration **Option 4**: Send the below form to

Free Hot Water
2146 Bering Drive
San Jose, CA 95131

Name: _____

Address: _____ _____

Phone: _____ _____

Email: _____

Name of Installer: _____

Main Application: _____
e.g.. Solar, Gas, etc

Domestic usage? Yes / No – if no specify: _____

Free Hot Water SST Model: _____

Product Serial Number: _____

Notes: _____

_____

WARRANTY

Free Hot Water will repair or if necessary replace a defected water heater or parts failed due to faulty manufacturing as per the following schedule:

Component	Installation	Warranty period	Coverage
All	All types of standard installations	First 12 months	Repair or replace 100% water heater and components free including labour at Free Hot Water discretion
Internal heat exchanger	Domestic standard installations	Year 2 to 5	Repair or replace 100% water heater free. Owner responsible for installation and labour costs
Internal heat exchanger	Commercial and other standard installations	Year 2 & 3	Repair or replace 100% water heater free. Owner responsible for installation and labour costs
		Year 4 & 5	Repair or replace 50% of water heater value. Owner responsible for installation and labour costs

Durability

Free Hot Water SST meets the requirements of the US Building Code for durability given that:

1. Installed and maintain by a qualified person and according to the building code and this manual
2. No damage in any way
3. Water quality according to page 5 of this manual

Change of Ownership

This warranty extends beyond the original purchaser of the water heater.

Standard Installation

Standard installation includes all connections as per this manual and any other connections approved by Free Hot Water service desk.
The water heater is installed where delivery and access is standard.
The customer may have to pay additional cost due to: difficult access (incl. roof cavity & narrow space), multiple storey or freight outside main centres.

PRODUCT INFORMATION

General product information

Maximum working pressure	115 PSI (800kPa)
Maximum water temperature	185 F (85°C)
Maximum coils working pressure	115 PSI (800kPa)
Maximum heat exchange temperature	200F (95°C)

Enamelled steel automatically welded
Insulation: 2" (50 mm) polyurethane
Usage indoor only

Note : The product must not be exposed direct sunlight, rain, snow, etc.
Outdoor installation decrease heater performance & may increased energy consumption.

Specific product information (2012)

Description	300lt	300lt SL	400lt	500lt	800lt	1000lt
	80 gal	80 gal	105 gal	132 gal	211 gal	264 gal
A - Height	47.64"	71.26"	62.20"	73.23"	66.93"	80.71"
B - Diameter	29.13"	23.62"	29.13"	29.13"	41.34"	41.34"
C - Cold water Inlet	2.87"	2.95"	2.87"	2.87"	4.33"	4.33"
D - Bottom Coil Cold	10.71"	9.49"	10.71"	10.71"	12.87"	12.87"
E - Sensor Case	21.42"	15.87"	23.38"	25.20"	31.10"	40.67"
F - Bottom Coil Hot	26.50"	36.93"	30.40"	34.17"	39.97"	49.41"
G - Circulation	33.78"	53.50"	47.75"	59.57"	49.60"	63.38"
H - Hot Water Outlet	44.37"	67.28"	58.15"	69.97"	62.83"	76.61"
Cleaning Door	DN100	Top Flange Door	DN100	DN100	DN100x2	DN100x2
Coil Inlet/Outlet	1" NPT (Female)	1" NPT (Female)	1" NPT (Female)	1" NPT (Female)	3/4" NPT (Male)	3/4" NPT (Male)
Circuit Inlet/Outlet	1" NPT (Male)	1" NPT (Male)	1" NPT (Male)	1" NPT (Male)	1 1/2" NPT (Male)	1 1/2" NPT (Male)
Diameter of service circulation	3/4" NPT (Male)	3/4" NPT (Male)	3/4" NPT (Male)	3/4" NPT (Male)	3/4" NPT (Male)	3/4" NPT (Male)
Weight (lbs.)	239	231	391	444	529	649

WATER QUALITY

Free Hot Water SST heater has been manufactured to deal with most qualities of US water supply.

Desired water quality levels: pH Level between 6.5 and 8.5
Chlorides: up to 200 ppm
Total Dissolved Solids (TDS) up to 1000 mg/L
Saturation Index between -0.8 and +0.8
If your water quality or the heating liquids are outside the above range, you should fit appropriate water filtration.

Caution:
If water TDS is above 600 mg/L, there is a possibility of hydrogen gas accumulating in the top of the water heater during long periods of no use.
If the water heater has not been used for more than 2 weeks:

- Open the hot water tap and let water flow for 1 minute.
- Hydrogen gas is flammable; therefore make sure that there is no smoking, sparks or naked flames near the tap.
- Do not operate any hot water appliance such as a washing machine or a dishwasher prior to the above procedure.

REGULAR CARE

Six Month:
Near the top of the water heater you will find the TPR Valve (Temperature Pressure Relief Valve). Raise the lower lever and gently release some water into the relief pipe.
Notes:

- If water does not flow down the relief pipe, or if water does not stop flowing once you released the lever, contact your plumber
- It is normal for the valve to release small amount of water during heating cycles
- Never block the relief drain pipe

Three year maintenance:
A qualified plumber should check and if needed replace the sacrificial anode of the water heater as per pages 13 & 14

Five year maintenance:
A qualified plumber should replace the TPR valve, of the water heater and should clean coils of the tank via the clearing door

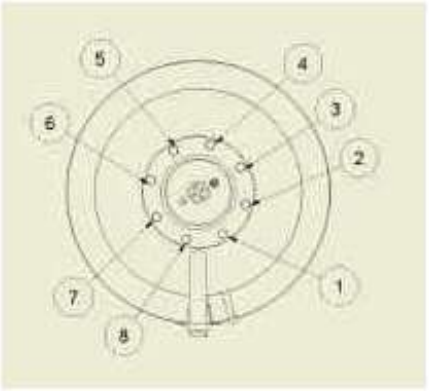
Coils Cleaning via Flange

Flange is located on the tank side for Free Hot Water tanks.

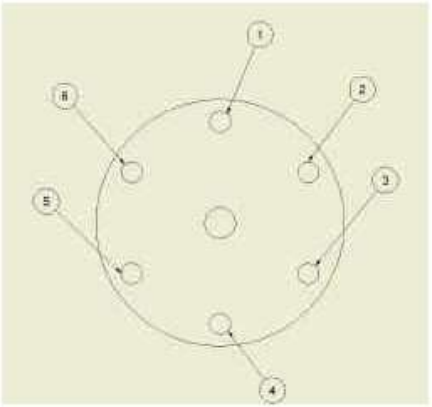
Over the years, tank and coils are covered with lime and other mineral deposit depending upon the water quality. After a while, heat transfer would be difficult and the tank's efficiency reduces due to the deposits. Therefore, clearing the coils should be periodically done from the clearing door.

1. Disconnect the power supply to the controller and water heater
2. Drain entire water from tank as per page 13 instructions.
3. Remove nuts of clearing door and remove service door
4. Gently water blast coils removing the mineral deposits
5. Replace clearing door gasket if required
6. It is **essential** to tighten up gasket nuts according to the below orders:

Free Hot Water SST
Order: 1-5, 3-7, 2-6 torque: 8Nm

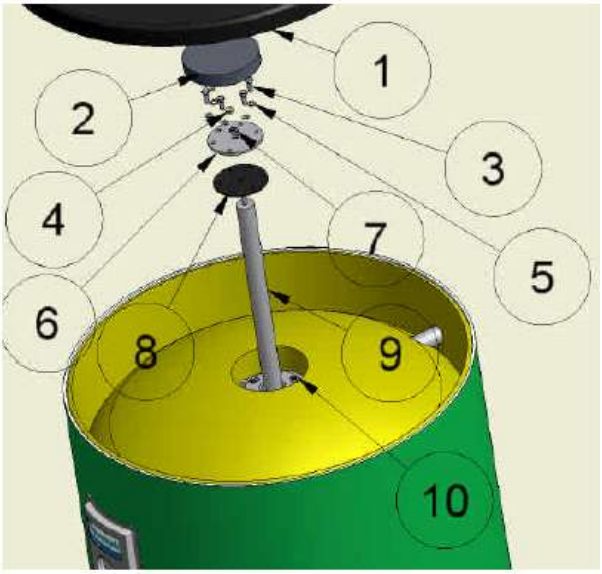


Free Hot Water SST
Order: 1-4, 6-3, 2-5 torque: 8N m



7. Fill up and pressurize water heater and check for leaks
8. Place a maintenance sticker on the water heater

Anode Replacement Free Hot Water 300DS to 1000D



1. Disconnect the power supply to the water heater.
2. Drain approximately 2 to 4 gallon from tank as per page 13 instructions.
3. 800D & 1000D: Drain entire water from tank as per page 13.
4. Remove tank top cap (1)
5. Take out stone wool insulation carefully and disassemble anode ground cable from flanges cap (6) then from flanges (10).
6. Disassemble the flanges (6) and (3) by removing the nuts.
7. Remove the flanges gasket (8).
8. Disassemble the flanges nut (4) and attached the anode rod (9).
9. Remove old anode rod (9) over flanges and keep the anode isolation bush and anode gasket (8).
10. Assemble new anode rod from the side of enamelled flanges (7) and leave isolated bush (5) on the other side, and install nut over anode behind the beam gear side.
11. Locate flange gasket through inlet of the tank. Replace gasket if needed
12. Locate flange exactly central side of the tank flange. Fasten nuts in a cross tightening order per page 18. Don't leave out nut flakes (5) – it needs to be opposite flange number (1) as shown.
13. Close the service cap on the bush of top cap.

PLUMBING CONNECTION

Delivering and mounting the Free Hot Water tank

- The product should be kept away from sharp tools during loading or delivering.
- The product's inlet and outlet pipes should be protected against any damages during delivery.
- The product should not be left or placed where it's exposed directly to weather such as direct sunlight, rain snow etc.
- If possible leave headroom of one water heater length so the anode can be inspected or replaced. Remember you may have to remove the entire water heater later for servicing as per pages 16 & 17.
- Outdoor installations decrease the water heater performance and may increase the energy consumption.
- If the product is installed on the floor, the floor must be dry and moisture-proof. Consider a drainage tray when required.
- Tank must be strapped and mounted in accordance to ASTM and ANSI Z21.10.3 standards
- Free Hot Water Limited does not accept any responsibility, if the product is physically damaged or operates inefficiently due to wrong mounting or inappropriate delivery.

Basic Plumbing connection of the Water heater

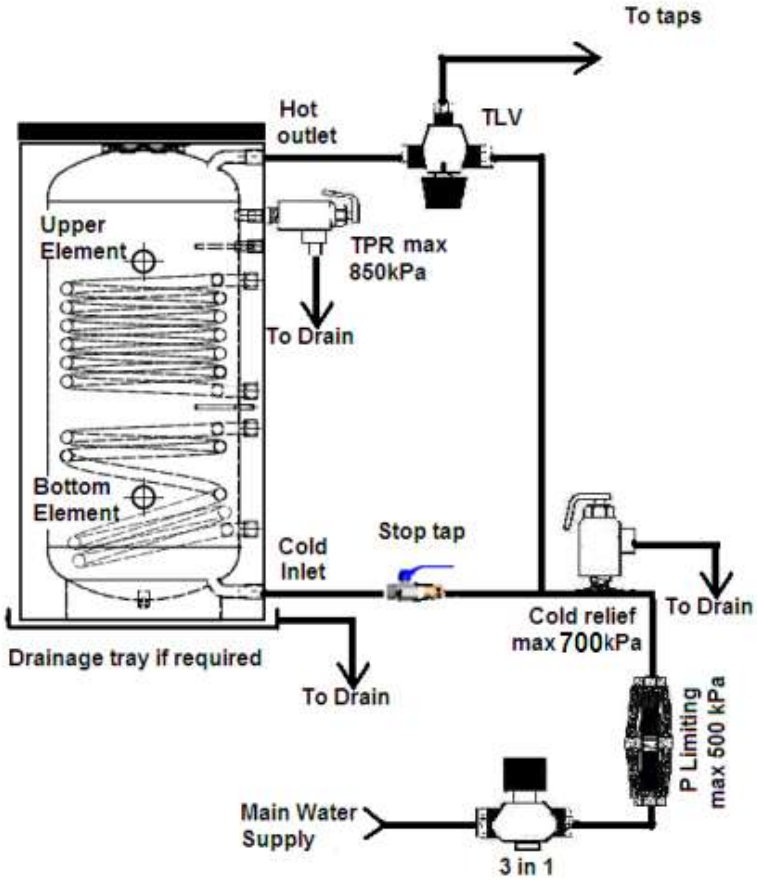
- In order to use the water heaters to their highest efficiency, tanks must be connected according to the diagrams.
  The capacity of the water resource has to be chosen and adjusted in order to maintain the hot water supply demand.
- Start with the Basic Diagram of page 7 before conducting any specific application connection
- Fit the cold inlet valves prior to commissioning the tank
- Ensure that the TPR Valve is fitted and that the service circulation is blocked or connected prior to commissioning the tank with water
- Lag all hot water pipes coming out of the water heater

Plumbing Connection of additional applications

- Simply follow the diagrams and the notes of page 8 to 12
- If you are in doubt or attempting to install an application outside the below diagrams, please contact Free Hot Water service desk for advice.

IMPORTANT NOTE:
When using copper pipes, use **Teflon** or FHWM-30572200 neutral adaptor between the brass fitting and the port thread to prevent electrolysis

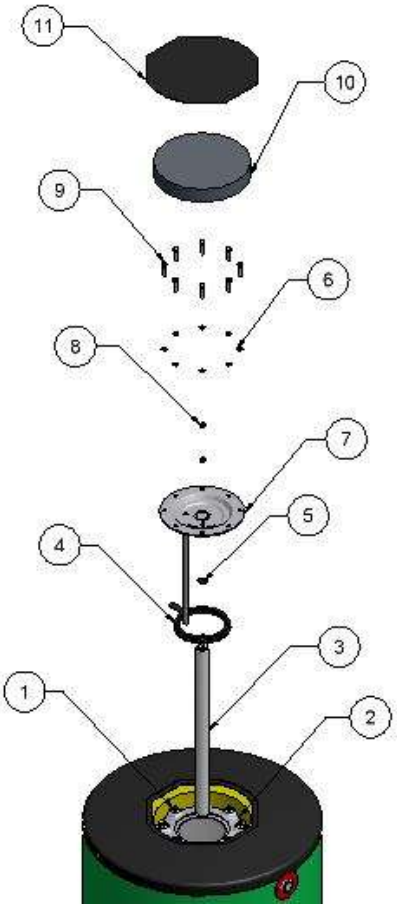
Free Hot Water Basic Plumbing Connection Diagram



Important Notes:
Valves are not supplied with the water heater
The above diagram describes valves for a mains pressure arrangement; however the tank could also be fitted to a low pressure system.
Free Hot Water tanks are equipped with a service circulation port.

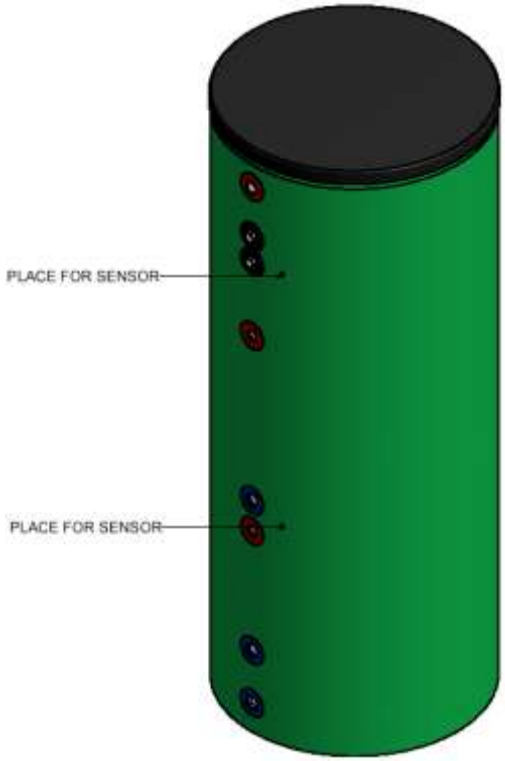
REGULAR CARE – SERVICE PERSON

Anode Replacement Free Hot Water SST



1. Disconnect the power supply to the water heater
2. Drain approximately 5 to 10 lt. from tank as per page 13 instructions.
3. Unscrew service cap (11) gently
4. Take out the soft foam insulation (10) and disassemble anode ground cable from flanges cap (7) and then from flanges (2).
5. Disassemble the flanges (7) and then remove the flanges gasket (4).
6. Open the nut that is on the flanges (7) and attach it to the anode rod.
7. Remove old anode rod (3) over flanges and keep the anode insulation bush and anode gasket (5).
8. Assemble new anode rod from the side of enamelled flanges (7); leave insulated bush (5) on the other side, and install nut over anode behind the beam gear side.
9. Locate flange gasket through inlet of the tank. Replace gasket if needed
10. Locate flange exactly central side of the tank flange. Fasten nuts in a cross tightening order as per page 18. Don't leave out nut flakes (6) – it needs to be directly opposite flange number (1) as shown.
11. Assemble stone wool; place the tail of thermometer couple on the bush, which is on the flange. Locate the service cap on the bush of top cap.

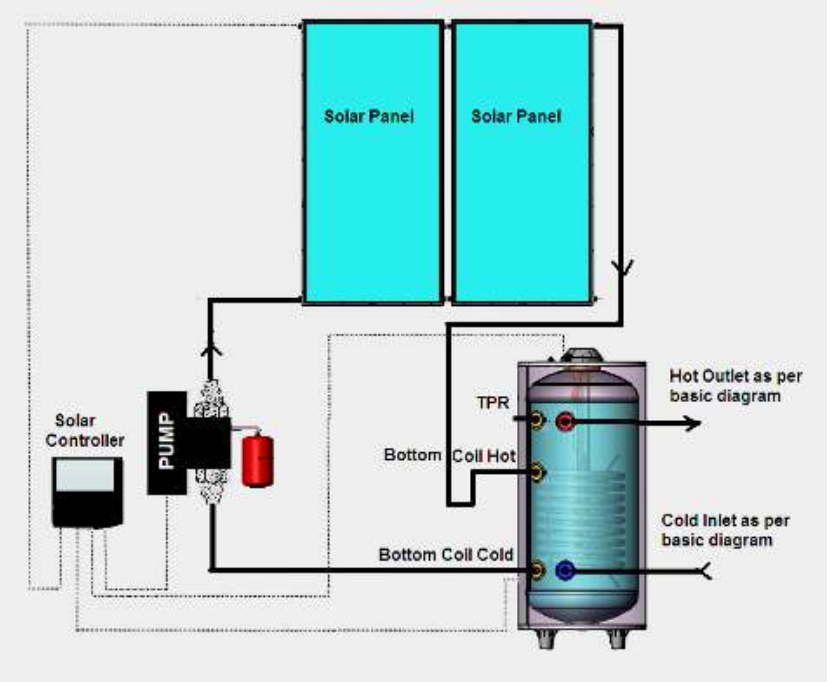
SENSORS CONNECTION



Sensors sense the temperatures when the tank is connected to heating applications, and transfer the reading to the controllers, such as 3 way valves, pumps and other electronic controllers.

Sensor bushes are located in the most appropriate level for heat distribution in the tank. Sensor holders must be used and supplied by the electronic control unit supplier. The holders attach the sensor to the surface which prevents the sensors from falling down from the hive. Make sure that probes are pushed all the way into the sensor tubes.

Free Hot Water Solar plumbing connection diagram



Important Notes:

1. The diagram shows generic drawings of connections to and from Free Hot Water tank. Follow the specific instructions of the solar panel supplier for the actual detailed arrangement, components and valves.
2. When using Free Hot Water tanks, solar collectors should be installed in bottom coil (boiler, or heaters should be installed in upper coil.
3. It is highly recommended running the solar system via the Free Hot Water coil on a close loop arrangement. Open loop solar is also possible using the Service Circulation port for the solar return instead of the Coil Hot port, and branching of the Cold Inlet instead of using the Coil Cold port.
4. When connecting commercial solar system, ensure that the energy going through the solar coil is lower than the max kW rating of the coil as per page 4. Excess energy above the coils rating will void the warranty.
5.

Warning: Open loop solar carries a frost risk to the panels since antifreeze is not used

COMMISSIONING

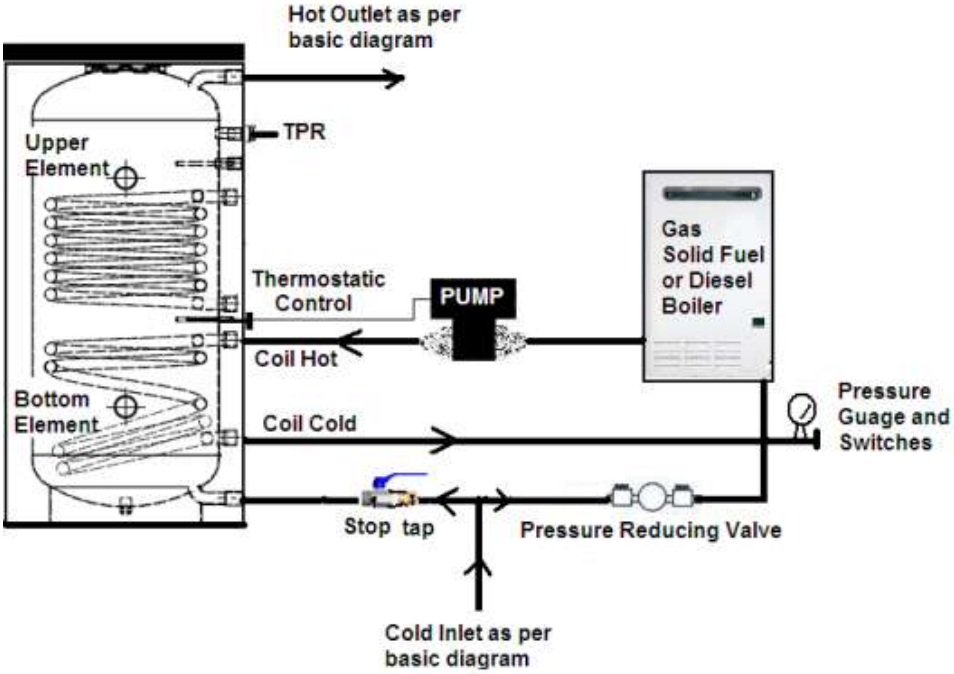
VERY IMPORTANT:
Prior to turning on any heating application such as solar, boiler or a heater, the tank MUST BE FILLED UP WITH WATER

- Make sure that all hot water taps are close off
- Open the inlet tap fully to fill up tank
- Open each hot water tap till water flows freely
- Check all pipes for leaks
- Switch on the elements and set the timer/controller (if one is installed)
- Attend to any other external heating applications

DRAINING THE WATER HEATER

- Turn off the power supply of the elements
- Turn off all external heating applications
- Turn off cold inlet supply at the 3 in 1 valve or at the meter
- Open a hot water tap to drain the plumbing
- Turn off the hot water tap
- Disconnect the hot water outlet union
- Open to atmosphere Cold Water Expansion Valve to let water flow via the drain pipe

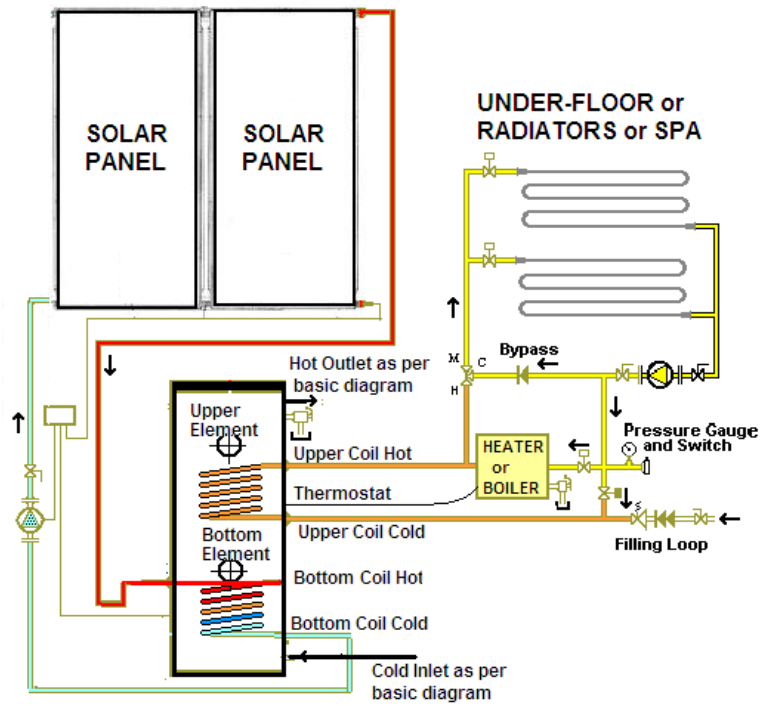
Free Hot Water Gas/Solid Fuel/Diesel Plumbing Connection Diagram



Important Notes:

1. The diagram shows generic drawings of connections to and from Free Hot Water tank. Follow the specific instruction of the heater / boiler supplier for the actual detailed arrangement, components and valves.
2. The heater / boiler must have an integrated relief valve
3. The energy input of the boiler must be smaller than the max kW rating of the coil. You may run the boiler via both coils using a loop; in that case the max heater energy allowed is the sum of both coils energy rating.
4. Excess energy above the coils rating will void the warranty.
5. The above diagram will maximize hot water flow rate.
6. Instantaneous water heaters should be installed after hot water outlet (temperature top up) in cases where high water flow is not required.

Free Hot Water Solar *plus* Heater/Boiler *plus* Radiant Heating /Radiator/ SPA - plumbing connection diagram



Important Notes:

1. Applicable for Free Hot Water only
2. The diagram shows generic drawings of connections to and from Free Hot Water Tank. Follow the specific instruction of the heater / boiler supplier, the Solar Panels supplier and the radiant / Radiators or SPA supplier for the actual detailed arrangement, components and valves.
3. The heater / boiler must have an integrated relief valve
4. The energy input of the boiler must be smaller than the max kW rating of the coil. Excess energy above the coils rating will void the warranty.
5. More options are available.

Free Hot Water Solar *plus* Boiler *plus* Heater/Boiler *plus* Radiant Heating / Radiator / SPA - plumbing diagram